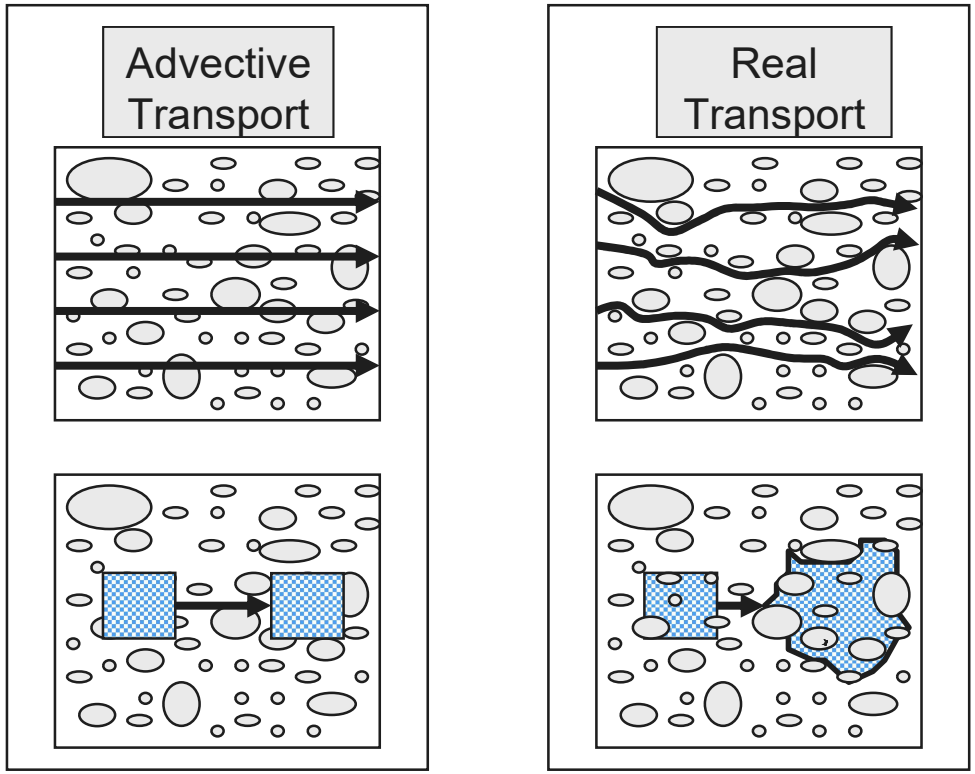
Dispersion and Diffusion



© DHI

Contaminant Transport

Processes:

- Advection
- Molecular diffusion
- Dispersion
- Numerical (artificial) dispersion

Challenges

- Oscillations can occur due to temporal and spatial discretization
- Solution for oscillations:
  - Fine meshing (Peclet number < 2)

$$Pe = \frac{\Delta x}{\alpha_L}$$

Choose element length smaller than dispersivity x 2 !

  - Damping techniques in space (upwind) and time (FE/BE)

All damping techniques add numerical (artificial) dispersion!

© DHI